Monika Santosh Hinge

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PROFILE

As a fourth-year B.Tech Energy Science student, I am actively involved in hands-on projects that amplify my theoretical knowledge. I have experience in cell making, conducted an energy audit for our university, and worked on enhancing the efficiency of solar panels. Utilizing PV Syst software, I've analyzed and optimized solar energy systems. Additionally, I've delved into 3D Experience CATIA software, expanding my proficiency in designing and simulating energy systems , I've analyzed and simulated energy systems, and designed dual-axis and single-axis solar trackers. These practical experiences have deepened my understanding and prepared me to contribute effectively to the field of energy science.

EDUCATION

Bachelor of Technology Energy Science 09/2022 – 08/2026
Atria University BANGALORE, India

PROFESSIONAL EXPERIENCE

Design Intern 05/2025 – 07/2025
Technogreen Bangalore
- Assisted in 3D HVAC system modeling using **ZW CAD** software.
- Supported the design team by performing **basic HVAC calculations** and learning industry-standard practices.

Research Intern – Energy Policy & Regulations 05/2024 – 08/2024
Prayas Energy Pune, India
- Conducted in-depth research on renewable energy policies, regulations, and rules across various Indian states.
- Analyzed government frameworks and policy trends impacting the renewable energy sector.

SKILLS

Technical Skills:
- Power Electronics: Buck & Boost converters
- Electrical Systems: Transfer function analysis, Electric drives, Sensor integration
- Renewable Energy: Solar panel performance, Heat transfer modeling (FDM), Thermal management.
- IoT & Embedded Systems: Raspberry Pi (C programming), Real-time data acquisition, and Fault detection.
- Simulation & Analysis: MATLAB/Simulink, Time-series data, Algorithm development.

Programming Skills Languages:
- C, MATLAB
- Applications: Data logging, Real-time monitoring, API integration

CERTIFICATES

- MATLAB: Circuit Analysis and Power Converters Modeling using Simulink and Simscape
- Coursera : Organic Solar Cells
- IEEE : Solar, Grid's Intricacies & Battery Energy Storage Systems (BESS)
- Solar Decathlon India: Net-Zero Energy and Water Buildings
- Coursera : Basics of Solar Panel

PROJECTS

Energy Audit for University Campus
- Led a team in conducting a comprehensive energy audit for the university campus.
- Utilized data analysis techniques to identify energy consumption patterns and areas for optimization.
- Implemented energy-saving measures resulting in a 2-3% reduction in electricity consumption.

Solar Panel Efficiency Enhancement Project
Tried to increase the efficiency of the solar panel by making a prototype , where the water pipe was fixed on the backside of the solar panel which maintain the temperature of solar panel . As solar panel work effectively at the temperature of 22 - 25 degree celsius .

Design and Construction of Dual-Axis and Single-Axis Solar Trackers
- Designed and built dual-axis and single-axis solar trackers model using LDR sensors .
- Conducted performance tests to evaluate tracking accuracy and solar energy capture.
- Demonstrated improved solar panel efficiency by up to 4% with dual-axis tracking system.

Real-Time Solar Panel Monitoring System
- Developed an IoT solution using Arduino Nano BLE 33 Sense to monitor solar panel performance based on environmental conditions.
- Utilized PV Syst software to optimize panel placement and calculate energy production estimates.
- Implemented data transfer to Raspberry Pi for cloud integration, enabling remote monitoring and analysis.

Advanced Battery Cell Development
- Directed a team in the development of an advanced battery cell for energy storage applications, focusing on enhancing both voltage output and capacity.
- Strategically selected and optimized anode and cathode materials, resulting in a voltage output ranging from 3.5 to 4 volts and achieving a higher capacity compared to conventional cells.
- Oversaw the cell assembly process to ensure precise construction and alignment of components, contributing to improved performance.

Industrial Drives and Control: Advanced Motor Control Strategies
- Developed AC & DC drive control systems for industrial applications
- Implemented closed-loop control using feedback & PID controllers
- Designed rectifier-based & inverter-fed motor drive circuits
- Optimized torque, speed, and load management for efficient operation
- Worked with PMSM, BLDC, and stepper motors using advanced control schemes

Energy Economics Project – Urban Renewable Energy Integration
- Designed a renewable energy integration plan of **70 GW capacity** for urban development.
- Performed **economic, technical, and policy analysis** to evaluate feasibility and sustainability.

Electrical System Design for a Commercial Mall (Bangalore)
- Designed a **comprehensive electrical system** for a commercial mall, covering **transformer and DG sizing, load assessment, and diversity factor analysis**.
- Developed **UPS system specifications** with battery backup design and **APFC panel configuration** for improved efficiency.
- Selected appropriate **switchgear types and ratings** ensuring reliability and safety in power distribution.
- Created **electrical room layout** considering ventilation requirements and **HVAC load analysis**.
- Ensured compliance with standards: **IS 732, NBC, IS 13947, IEC 61439, IEEE**